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PROCTOR, JASON SCOTT	
ART UNIT	**PAPER NUMBER**
2123	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/914,487	SHKOLNIK, SHLOMO	
	Examiner	Art Unit	
	Jason Proctor	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *23-26,30-43,51,53-77 and 80-92* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *23-26,30-43,51,53-77 and 80-92* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 23-26, 30-43, 45-77, and 79-86 were rejected in the Office Action entered on 3 May 2007.

The cumulative effect of Applicants' submissions on 1 October and 22 October 2007 is to amend claims 23-24, 32, 34, 51, 57, 77, 82, 82-84; cancel claims 45-50, 52, and 79; and present new claims 87-92.

Claims 23-26, 30-43, 51, 53-77, and 80-92 are pending.

Claims 23-26, 30-43, 51, 53-77, and 80-92 are rejected.

Response to Arguments – 35 USC § 112

And Claim Interpretation

Previous rejections under 35 U.S.C. § 112 that are not reiterated below have been withdrawn in response to the amendments to the claims.

Claim 23

1. The amended language of claim 23 "opening the index for viewing by workers assigned to a plurality of systems of the vehicle" requires that the worker opening the index is assigned to a plurality of systems of the vehicle. A worker who is assigned to one system of the vehicle opening the index is beyond the scope of the claim. Several claims recite similar terminology. This interpretation is based upon the plain meaning of the claim language.

Claim 32

2. This previous interpretation of lines 11-14 of claim 32 is found in the 3 May 2007 Office Action, page 5:

> *That is, the plain and ordinary meaning of Applicants' claim language excludes mechanical information, structural information, and any other non-hydraulic or non-electronic design information from the information. The information includes **only** a subset of hydraulic design information and a subset of electronic design information.*

In response to this previous interpretation, Applicants submit that:

> As to the Examiner's response to arguments with respect to claim 32, applicant believes that the Examiner has misunderstood both the claim language and applicant's previous arguments. The claim language does indeed say that only a subset of the hydraulic and electrical information is in the database. However, the claim is completely silent as to the completeness of other design information and not as the Examiner indicates in the paragraph bridging pages 5 and 6 of the current office action.

The Examiner traverses this argument as follows.

Claim 32 **is not silent** as to other information in the database. Claim 32 explicitly recites that **only** a subset of hydraulic design information and electronic design information is included in the database (lines 11-14 of Claim 32).

Webster's New Universal Unabridged Dictionary, copyright 1996, provides the following definitions.

> **only** 1. without others or anything further; alone; solely; exclusively. 2. no more than; merely; just.

Applicants' suggested interpretation of claim 32 has been fully considered but has been found unpersuasive. The Examiner maintains the previous interpretation of claim 32 as proper.

3. In response to the 31 October 2006 rejection of claim 32 under 35 U.S.C. § 112, second paragraph, as being indefinite for use of the phrase "disciplines of the vehicle," Applicants submission on 28 February 2007 argues that:

> The Examiner further stated that the term "disciplines of the vehicle" is vague and indefinite. Applicant refers to the following definition of the term "discipline" at www.dictionary.com:
> "9. a branch of instruction or learning: the disciplines of history and economics."

Applicants do not appear to provide any further explanation.

The Examiner submits that "a branch of instruction or learning of the vehicle" is as indefinite as the phrase "disciplines of the vehicle." The Examiner does not understand the apparent comparison between the term "vehicle" and "history and/or economics". Applicants' arguments have been fully considered but have been found unpersuasive.

Applicants have not traversed the corresponding rejection in the current response. Applicants have amended claim 32 to read "*engineering* disciplines of the vehicle" and "*technical* discipline of the vehicle" (lines 16-17) which neither overcomes nor substantively addresses this rejection.

Claim 77

4. The previous rejection of claim 77 under 35 U.S.C. § 112, second paragraph, as being indefinite for use of the phrase "such that the gathered information does not include

sufficient information for at least some of said design tasks for which the computerized design tools are adapted," is withdrawn. The claim language defines the scope of the claim. In this case, the claimed apparatus includes "a computer configured to gather [...] information," wherein the scope of "information" is so broad that it encompasses "nothing". This is the direct result of the explicitly recited claim language "the gathered information does not include sufficient information for performing any of said design tasks for which the computerized design tools are adapted."

Claim 84

5. The previous rejection of claim 84 under 35 U.S.C. § 112, second paragraph, as being indefinite for the phrase "wherein generating the database comprises generating a database including information insufficient to allow performing all the design tasks of the vehicle, which can be performed by the computerized tools" is withdrawn. The claim language defines the scope of the claim. In this case, the claimed method includes "gathering [...] information," wherein the scope of "information" is so broad that it encompasses "nothing". This is the direct result of the explicitly recited claim language "generating a database including information insufficient to allow performing all the design tasks of the vehicle, which can be performed by the computerized tools."

In response to the previous rejection, Applicants argue primarily that:

> The Examiner states that claim 84 could mean that the database includes no information. Applicant disagrees. Claim 84 is dependent on claim 82. If the combination of claims 82 and 84 is considered, this reading of claim 84 is not possible.

The Examiner respectfully traverses this argument as follows.

The relevant portion of claim 82 reads:

> Generating a database including information on the relationship between elements of the vehicle from the various systems, but including information on fewer than all the elements of the vehicle, said database being open to viewing by workers assigned to a plurality of said systems;

The relevant portion of claim 84 reads:

> Wherein generating the database comprises generating a database including information insufficient to allow performing all the design tasks of the vehicle, which can be performed by the computerized tools.

Generating a database including no information reads on both limitations. None is clearly less than all the elements of the vehicle, and no information is insufficient to allow performing all the design tasks of the vehicle.

During the 17 October 2007 interview, the Examiner suggested that Applicants claim what is included in the database to assist in particularly pointing out and distinctly claiming the invention. Applicants persist in claiming the invention according to what is not included in the database. As a result of these negative limitations, the claim language as written encompasses a database containing no information.

Applicants' arguments have been fully considered but found unpersuasive. The previous rejection is withdrawn. However, the Examiner submits that the interpretation explained above is proper.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. § 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims rejected but not specifically mentioned stand rejected by virtue of their dependence.

Independent claim 23 and dependents

6. Claims 23-26, 30-31, 75-76, and 79-81 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 23, the following claim language lacks antecedent basis:

"the vehicle" in line 3; **Applicants have not addressed this rejection.**

"the information" in line 10, which ambiguously refers to either "information" in line 4, or "information" in line 6, or "information" in line 8; **Applicants have not addressed this rejection.**

Independent claim 32 and dependents

7. Claims 32-40, 43, and 53-71 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 32, the phrase "engineering disciplines of the vehicle" is vague and indefinite.

In claim 32, the phrase "technical discipline of the vehicle" is vague and indefinite.

Claim 82 and dependents

8. Claims 82-85 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 82, the phrase "the vehicle" in line 2 lacks antecedent basis. **Applicants have not addressed this rejection.**

Claim 86 and dependents

9. Claims 88 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The following illustrates the indefinite nature of claim 88.

> "A method according to claim 86 wherein **the contained information** [lacks antecedent basis] is limited to data that is **essential** [relative terminology] to **each authorized user** [lacks antecedent basis] for determining **possible problems** [vague terminology] connected with issues **the user** [lacks antecedent basis] is **not qualified to solve** [relative terminology] and does not have **primary responsibility** [relative terminology] for."

Response to Arguments – 35 USC § 103

10. In response to the previous rejection of claims 23-26, 30-43, 45-77, and 79-86 under 35 U.S.C. § 103 as being unpatentable over Thackston in view of Carver, Applicants argue primarily that:

> Looking first at the rejection of claim 23, the Examiner on page 17 (first full paragraph) identifies the virtual scratch pad of Thackston with the database formed by gathering the information and then identifies the index of Thackston with the index claimed in the next paragraph of the claim. Applicants submit that there is no index formed of the scratch pad information and that even if there was, this index is not made available to workers outside the group that is using the scratch pad. The index of Thackston that is indicated by the Examiner is an index of the entire system. This is in contrast to the method of claim 23 in which the index is of the gathered information and this index is made available to all the workers on the vehicle.

The Examiner respectfully traverses this argument as follows.

Thackston teaches that the index is formed by gathering information from computerized design tools [*"Alternatively, the conversion utility of CAD processing module 932 could be used to upload and convert for storage in a neutral format a part design model already in existence (i.e., not initially created using the NICECAD collaborative, virtual environment)."* (column 21, lines 50-55); *"Check-in/check-out controls generally refers to the procedures employed by the NICECAD system to control access to proprietary part design model and specification data."* (column 14, lines 52-55)].

Thackston teaches that the index does not contain information on all the elements required for design of the system described by a tool [*"Stored working copy part design model data module 892 may be used by designers and analysts as a virtual "scratch pad" for storing part design models. For example, an EAS team member who checks out the current baseline part design model from module 865 may not be permitted to "check in" that part design model. [...] However, the EAS team member may use stored working copy part design model data module 892 to store a "working copy" of the part design*

model. [...] Project team members may also use this module to temporarily store working copies of the baseline part design model while they are completing their analysis." (column 15, lines 45-65)].

The claim does not require that the excluded information ("working model" in the "virtual scratch pad") is made available to workers outside the group that is using the excluded information.

Applicants' arguments have been fully considered but have been found unpersuasive.

Applicants submit similar arguments for claim 32 which are similarly unpersuasive.

Regarding claim 72, Applicants argue primarily that:

> Claim 72 appears to be rejected based on MPEP §2144 (II)A, that omission of an element and its function is obvious of the function of the element is not desired. Applicant submits that this idea has been misapplied and that the Examiner has not provided the rational required by this section of the MPEP, by the cases cited in the MPEP section and by other cases. In order not to break the flow of the response, as section on the case law is included as an appendix.
> [...]
> Applicant submits that this is not the case here, since the entire concept of the system of Thackston depends on having information on all parts available to each of the designers. Thackson is based on the premise, on which all prior art systems are based, that in order to allow each of the subsystems to be designed properly, information on all or substantially all of the parts had to be available to all the designers. It would not have been obvious, based on Thackston, to remove almost all the elements from the database.
> The Examiner respectfully traverses this argument as follows.

Thackston clearly does not depend on having information on all parts available to each of the designers. See Thackston, column 15, lines 46-65, et seq. Thackston deliberately describes a system in which "baseline" models are stored in a central index, available to those workers with appropriate permissions (Thackston, column 15, lines 8-

26, etc.) while individual teams "check out" the models to perform specialized design work for their respective systems (column 15, lines 46-65).

Applicants' argument is founded on an incorrect interpretation of the Thackston reference. For the reasons previously set forth, it would have been obvious to a person of ordinary skill in the art at the time of Applicants' invention to omit the undesired elements in order to save space, to simplify the design process, or to enhance the security features described by Thackston.

Applicants' arguments have been fully considered but have been found unpersuasive.

Regarding claim 77, Applicants submit that "the claim clearly excludes any database or scratch pad of Thackston, which includes sufficient information utilized by a tool to perform at least one design to design at least one design task.

The Examiner respectfully traverses this rejection as follows. Thackston teaches that the design teams must augment the information retrieved from the index to perform a design task (column 15, lines 45-65, et seq.). Thus the stored information "check out" to create the virtual scratch pad of Thackston contains insufficient information for performing any design tasks of the computer design tool.

Applicants' arguments have been fully considered but have been found unpersuasive.

Regarding claims 82 and 86, Applicants submit arguments similar to those for claim 72. These arguments are unpersuasive for the reasons set forth above.

Regarding claim 87, Applicants submit that the claim is patentable over Thackston in view of Carver. These arguments have been found unpersuasive for the reasons set forth below in the rejection under 35 U.S.C. § 103.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. § 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claims 23-26, 30-43, 51, 53-77, and 80-92 are rejected under 35 U.S.C. § 103(a) as being unpatentable over US Patent No. 6,295,513 to Thackston in view of US Patent No. 4,937,768 to Carver et al.

Regarding claim 23, Thackston teaches a method of forming a design index, comprising:

Providing a plurality of computerized design tools (FIG. 15), said tools being adapted for carrying out a design task of a particular system [*"This module may provide PDM management when cooperating with a CAD processing module that provides substantive CAD processing to a user relying on a working copy."* (column 20, lines 44-49); "CAD processing" throughout], at least some of which tools store information restricted to viewing by a respective limited group of workers [*"Stored design and analysis access permission data module 860 may comprise data assigned by the prime contractor determining which teams (or team members) may access the part design model, documents and EAS processing modules."* (column 15, lines 7-11)];

Which workers are assigned to a particular system or systems [*"In our sonobuoy example, there will be mechanical engineers, electrical engineers, RF engineers, acoustic specialists, reliability engineers, safety engineers, signal processing specialists, production engineers and so on."* (column 2, lines 9-13)];

Gathering, by a computer, from the plurality of computerized design tools, information on elements of different systems of the project [*"Stored baseline part design model data module 865 may contain the current approved version of the design referred to as the 'baseline.' ... A part design model may be created using the NICECAD CAD capability... In general, stored baseline part design model data module 865 may contain the part design models, such as 3D solid models, including attributes, for the projects in the NICECAD system 100."* (column 15, lines 28-45)];

Wherein the gathering includes retrieving from at least one of the computerized tools information on fewer than all the elements required for design of the system described by the tool [*"Stored working copy part design model data module 892 may be*

used by designers and analysts as a virtual "scratch pad" for storing part design models. For example, an EAS team member who checks out the current baseline part design model from module 865 may not be permitted to 'check in' that part design model." (column 15, lines 46-55)];

Storing the information in the index (column 15, lines 28-45);

Opening the index for viewing by workers assigned to a plurality of systems [*"Teams, such as EAS teams, may need access to all or part of a part design model in order to carry out the analysis for their specific discipline. They may need to access specifications or other documents to perform their task."* (column 15, lines 15-27)];

Wherein storing the information in the index comprises storing only information which is authorized for viewing by workers assigned to the plurality of systems [*"Stored design and analysis access permission data module 860 allows an approval authority to assign access permissions to limit access to those portions of the part design module, those specifications (or portions thereof), and those EAS processing modules as appropriate. This serves configuration control by limiting access to only those who need it."* (column 15, lines 15-27)].

Thackston does not explicitly teach a "vehicle" example.

Carver teaches a method of designing a vehicle using CAD [*"A 3-D CAD program or programs, such as CATIA (IBM Corporation) or NCAD and NCAL (Northrop Computer Aided Design and Northrop Computer Aided Lofting, Northrop Corporation, Hawthorne, Calif.) would be suitable to define the master engineering definition of the aircraft 154 in 3-D graphics in the data model."* (column 22, lines 48-54)].

Carver and Thackston are analogous art because both are drawn to CAD.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of Applicants' invention to combine the teachings of Carver with Thackston as expressly motivated by Carver to precisely produce aircraft [*"This invention provides for new and improved methods and apparatus for precisely producing and assembling a multi-copmonent structure such as an aircraft."* (column 6, lines 62-64)] without the disadvantages of prior art methods (columns 1-6). The combination could replace Thackston's "sonobuoy" example with a "vehicle," thus producing the claimed "vehicle design index," "different system of the vehicle," and "elements of the vehicle" as claimed.

Regarding claim 24, Carver teaches gathering the information comprises gathering information on the location of elements in the vehicle [*"The operator selects a portion of the total structure, as for instance the port side fuselage section 204 of FIG. 4."* (column 24, lines 1-2)].

Regarding claim 25, Carver teaches gathering interconnection information of the elements [*"The operator selects a portion of the total structure, as for instance the port side fuselage section 204 of FIG. 4."* (column 24, lines 1-2); *"A stressed skin construction for an aircraft relies upon the strength of the outer skin and attached components and not on strength imparted by internal structural members which might traverse or crisscross through the interior of the aircraft."* (column 1, lines 49-64)].

Regarding claim 26, Thackston teaches gathering references to documents describing the elements [*"In one embodiment, a design team member may associate a standard (e.g. MIL-STD-5556.8) with a particular graphical entity when creating a part design model. When viewing the design using a CAD tool (e.g., see FIG. 9, module 932) a fabricator team member may see the standard associated with a particular entity that may be 'clicked on' to link to the text of the standard."* (column 16, lines 44-51)].

Regarding claim 30, Carver teaches gathering information on elements of an aircraft [*"A 3-D CAD program or programs, such as CATIA (IBM Corporation) or NCAD and NCAL (Northrop Computer Aided Design and Northrop Computer Aided Lofting, Northrop Corporation, Hawthorne, Calif.) would be suitable to define the master engineering definition of the aircraft 154 in 3-D graphics in the data model."* (column 22, lines 48-54)].

Regarding claim 31, Thackston teaches gathering information periodically [*"Data backup and archiving processing module 1013 may comprise a module supporting periodic backing up and archiving of data (e.g., see FIG. 2, module 250)."* (column 19, lines 41-43)].

Regarding claim 32, Thackston teaches a method of providing information between workers designing different systems of a project, comprising:

Providing a plurality of different types of computerized design tools, each having stored therein sufficient information for carrying out a design task of a respective system of the project (FIG. 15);

The tools including at least a hydraulic design tool storing hydraulic design information and an electrical design tool storing electrical design information [*"In our sonobuoy example, there will be mechanical engineers, electrical engineers, RF engineers, acoustic specialists, reliability engineers, safety engineers, signal processing specialists, production engineers and so on."* (column 2, lines 9-13); *"Quick HDL or Autologic HDL™ from Mentor Graphics Corp."* (column 22, lines 22-49); *"Fluid dynamics analysis processing module 1510 may use numerical techniques to evaluate performance of a part design in a fluid environment, and may include measurement of such parameters as pressure, temperature, and density distributions."* (column 26, lines 24-40)];

Thackston teaches gathering, for each of a plurality of elements of the project, information regarding the element [*"Stored baseline part design model data module 865 may contain the current approved version of the design referred to as the 'baseline.' ... A part design model may be created using the NICECAD CAD capability... In general, stored baseline part design model data module 865 may contain the part design models, such as 3D solid models, including attributes, for the projects in the NICECAD system 100."* (column 15, lines 28-45)];

And a reference to a worker in charge of the element [*"Stored design and analysis access permission data module 860 may comprise data assigned by the prime contractor*

determining which teams (or team members) may access the part design model, documents and EAS processing modules." (column 15, lines 7-11)];

Storing the gathered information in a database having a record for each of the plurality of elements, wherein the database includes information from each of said design tools, said information including only a subset of said hydraulic design information and said electronic design information [*"Databases 210 may store information for a concurrent engineering development project, such as contracts data, engineering data, account data and other project related data..."* (column 11, lines 17-21); Omission of an element and its function is obvious is the function of the element is not desired – MPEP 2144.04 (II); Storing "only a subset of hydraulic design information and said electronic design information" merely omits to store any additional information, and does not retain the benefit of storing the additional information];

Opening the database for viewing by workers of a plurality of departments, assigned to different systems or engineering disciplines of the vehicle [*"Teams, such as EAS teams, may need access to all or part of a part design model in order to carry out the analysis for their specific discipline. They may need to access specifications or other documents to perform their task."* (column 15, lines 15-27)];

Searching the database, by a first worker assigned to one system or technical discipline of the vehicle, for information on one or more of the elements, and displaying information relating to the one or more elements; and sending an electronic message, by the first worker, to a second worker assigned to another system or engineering discipline of the vehicle, responsive to information found in the search [*"Multimedia communications processing module 978 provides the multimedia communications*

capability of the system and, as depicted in FIG. 13..." (column 24, lines 28-43); *"Quasi-real time graphics processing module 1306 is a module that may permit participants in an on-line communications session to view graphics, such as a 3D part design model or 2D section cuts, rotations, fly-throughs, zooms or pans in a substantially concurrent manner... This would allow, for example, one design team member to engage in the design effort with another remotely located design team member. This would allow, for example, a design team member to interact with a remotely located fabricator team member to view sectional cuts at the same time in order to discuss producibility issues."* (columns 24, line 66 – column 25, line 22)].

Thackston does not explicitly teach a "vehicle" example.

Carver teaches a method of designing a vehicle using CAD [*"A 3-D CAD program or programs, such as CATIA (IBM Corporation) or NCAD and NCAL (Northrop Computer Aided Design and Northrop Computer Aided Lofting, Northrop Corporation, Hawthorne, Calif.) would be suitable to define the master engineering definition of the aircraft 154 in 3-D graphics in the data model."* (column 22, lines 48-54)].

Carver teaches gathering an indication of the interaction of a gathered element with elements other than those in the same system as the gathered element [*"The operator selects a portion of the total structure, as for instance the port side fuselage section 204 of FIG. 4."* (column 24, lines 1-2); *"A stressed skin construction for an aircraft relies upon the strength of the outer skin and attached components and not on strength imparted by internal structural members which might traverse or crisscross through the interior of the aircraft."* (column 1, lines 49-64)].

Carver and Thackston are analogous art because both are drawn to CAD.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of Applicants' invention to combine the teachings of Carver with Thackston as expressly motivated by Carver to precisely produce aircraft [*"This invention provides for new and improved methods and apparatus for precisely producing and assembling a multi-copmonent structure such as an aircraft."* (column 6, lines 62-64)] without the disadvantages of prior art methods (columns 1-6). The combination could replace Thackston's "sonobuoy" example with a "vehicle," thus producing "plurality of elements of the vehicle," and "elements of the vehicle" as claimed.

Regarding claim 33, Thackston teaches gathering references to documents describing the elements [*"In one embodiment, a design team member may associate a standard (e.g. MIL-STD-5556.8) with a particular graphical entity when creating a part design model. When viewing the design using a CAD tool (e.g., see FIG. 9, module 932) a fabricator team member may see the standard associated with a particular entity that may be 'clicked on' to link to the text of the standard."* (column 16, lines 44-51)].

Regarding claim 34, Carver teaches gathering at least one indication of the location of the element in the vehicle [*"The operator selects a portion of the total structure, as for instance the port side fuselage section 204 of FIG. 4."* (column 24, lines 1-2)].

Regarding claim 35, Carver teaches that indication of the location of the element comprises an indication of the coordinates of the element within the vehicle [*"This is typically achieved in a 3-D graphics software program using X, Y and Z coordinate points as well as appropriate locating vectors where necessary."* (column 19, lines 58-63)].

Regarding claim 36, Carver teaches that the indication of the location of the element comprises an indication of an access door to the element within the vehicle [FIG. 4, reference 154 depicting at least a canopy acting as an access door to the interior of the cockpit.].

Regarding claim 37, Carver teaches that the indication of the location of the element comprises an indication of a compartment in which the element is located [*"From this major structural component, i.e. section 204, the operator taking advantage of the lofting lines and other design data in the data model selects a particular component part such as a virtual skin panel 206."* (column 24, lines 1-11)].

Regarding claim 38, Thackston teaches that the indication of the relative assembly of the element comprises a list of elements with which the element is connected [*"Assembly simulation module 1516 may use numerical techniques to simulate the assembly process for a part design model to evaluate the producibility thereof."* (column 26, lines 38-40); *"Component interface analysis processing module 1520 may use*

numerical techniques to evaluate the interface between parts of a part design model, or between the part design model and external items." (column 26, liens 47-50)].

Regarding claim 39, Thackston teaches that the indication of the relative assembly of the element comprises an indication of a system to which the element belongs [*"Teams, such as EAS teams, may need access to all or part of a part design model in order to carry out the analysis for their specific discipline. They may need to access specifications or other documents to perform their tasks. Likewise, those teams may need to access one or more EAS processing modules to carry out the analysis. Stored design and analysis access permission data module 860 allows an approval authority to assign access permissions to limit access to those portions of the part design module, those specifications (or portions thereof), and those EAS processing modules as appropriate."* (column 15, lines 8-27)].

Regarding claim 40, Thackston teaches that the indication of the system to which the element belongs comprises an indication of a function of the element within the system [*"Teams, such as EAS teams, may need access to all or part of a part design model in order to carry out the analysis for their specific discipline. They may need to access specifications or other documents to perform their tasks. Likewise, those teams may need to access one or more EAS processing modules to carry out the analysis. Stored design and analysis access permission data module 860 allows an approval authority to assign access permissions to limit access to those portions of the part design*

module, those specifications (or portions thereof), and those EAS processing modules as appropriate." (column 15, lines 8-27)].

Regarding claim 41, Thackston teaches running a verification routine which finds design faults on the data contained within the database [*"Motion simulation module 1512 may use numerical simulation techniques to evaluate performance of a part design while in motion, such as to determine interference between components or with other objects in the operational environment, and to determine whether pressures and forces are excessive."* (column 26, lines 24-40)].

Regarding claim 42, Thackston teaches running a routine which checks for elements which are distanced from each other less than a minimal allowed distance [*"Motion simulation module 1512 may use numerical simulation techniques to evaluate performance of a part design while in motion, such as to determine interference between components or with other objects in the operational environment, and to determine whether pressures and forces are excessive."* (column 26, lines 24-40)].

Regarding claim 43, it would have been obvious in light of Thackston in view of Carver for the database to not include diagrams or drawings [Omission of an element and its function is obvious is the function of the element is not desired – MPEP 2144.04 (II); "not including diagrams or drawings" merely omits storing this additional information, and does not retain the benefit of storing the additional information].

Further, claim 43 does not recite a method step, but rather an initial condition. Claim 32 recites "storing the gathered information in a database," and where the "gathered information" includes diagrams or drawings, the resulting database is beyond the scope of claim 43.

Regarding claim 51, Thackston teaches that the configuration management codes comprise three digits [*"In one embodiment, this module may contain the entire history of baseline designs, each of which is assigned a version number for tracking purposes (e.g., Design 1.00, 1.01, 1.02, etc.). The latest version number may be the current baseline design."* (column 15, lines 41-45)].

Regarding claim 53, Thackston teaches gathering a plurality of different indications of the relative assembly of the element [*"Data backup and archiving processing module 1013 may comprise a module supporting periodic backing up and archiving of data (e.g., see FIG. 2, module 250). This module may also support the resort to backup server hardware and/or software (e.g., see FIG. 2, module 240) when there are system crashes or other interruptions in availability of the primary server hardware and software (e.g., see FIG. 2, module 200)."* (column 19, liens 41-48)].

Regarding claim 54, Thackston teaches gathering at least three levels of a hierarchy of systems and sub-systems to which the major elements belong [*"Component interface analysis processing module 1520 may use numerical techniques to evaluate the*

interface between parts of a part design model, or between the part design model and external items." (column 26, lines 47-50)].

Regarding claim 55, Thackston teaches gathering only for elements which are related to by a plurality of different computerized design tools [Thackston does not disclose gathering information for elements which are related to by non-computerized design tools. Claim 55 presents only a negative limitation.].

Regarding claim 56, Thackston teaches that the indication of the relative assembly comprises an indication in each record of elements which are functionally related to the element described by the record [*"Teams, such as EAS teams, may need access to all or part of a part design model in order to carry out the analysis for their specific discipline. They may need to access specifications or other documents to perform their tasks. Likewise, those teams may need to access one or more EAS processing modules to carry out the analysis. Stored design and analysis access permission data module 860 allows an approval authority to assign access permissions to limit access to those portions of the part design module, those specifications (or portions thereof), and those EAS processing modules as appropriate."* (column 15, lines 8-27)].

Claims 57 and 58 fail to define a method step, but rather describe the storage size of the database. Carver teaches an aircraft (column 22, lines 48-54). Thackston teaches a database (FIG. 2, reference 210). The claimed change in size is found to be obvious over

the prior art. The clear advantage would be to save storage space. See MPEP 2144.04 (IV)

Regarding claim 59, it would have been obvious in light of Thackston in view of Carver to gather information for fewer than 10% of the physical elements of the vehicle, described by the computer design tools. The claim merely specifies the omission of information describing the other 90% of the elements. Omission of an element and its function is obvious if the function or element is not desired. It would have been obvious to omit the information pertaining to the other 90% of the elements to save storage space. See MPEP 2144.04(II)

Regarding claim 60, Thackston teaches that the references to the documents comprise hypertext links [*"In one embodiment, a design team member may associate a standard (e.g. MIL-STD-5556.8) with a particular graphical entity when creating a part design model. When viewing the design using a CAD tool (e.g., see FIG. 9, module 932) a fabricator team member may see the standard associated with a particular entity that may be 'clicked on' to link to the text of the standard."* (column 16, lines 44-51)].

Regarding claim 61, Thackston teaches that the documents comprise references to diagrams including the elements [*"This module may be used by designers to associate particular standards with graphical entities of a part design model."* (column 16, lines 40-51)].

Regarding claim 62, Thackston teaches that the documents comprise references to procurement invoices of the elements [*"GMR graphics server 2710 ... provides for manufacturing vendor engineer and craftsmen (2770) to view the stored part design model..."* (column 49, lines 46-55); *"Continuing with the ETC aspect of the invention, the RFQ may be submitted or 'posted' to GMR graphics server 2710 via browser templates completed by GMR user 2600. The RFQ may include such information as a project identifier, narrative description, quantity requirements, schedule requirements, delivery requirements, and the like."* (column 50, lines 43-65); also FIG. 21, reference 2250].

Regarding claim 63, Thackston teaches that each of the elements is identified in the database by a unique code which is assigned according to a functionality of the element [*"In one embodiment, this module may contain the entire history of baseline designs, each of which is assigned a version number for tracking purposes (e.g., Design 1.00, 1.01, 1.02, etc.). The latest version number may be the current baseline design."* (column 15, lines 41-45); *"In one embodiment, the working copies stored in this module by NICECAD server 200 are assigned working copy version numbers. In another embodiment, the working copy version numbers are maintained so that there is a complete history of all working copies of the part design model in the NICECAD system."* (column 15, line 66 – column 16, line 4)].

Regarding claim 64, Thackston teaches that gathering the information comprises gathering from at least one computerized tool such that an update of information in the at

least one computerized tool automatically updates the database [*"Check-in/check-out controls generally refers to the procedures employed by the NICECAD system to control access to proprietary part design model and specification data... Once the team member completes the task, he/she may have to 'check in' the item by informing the NICECAD system that the task is complete. By updating the check-in/check-out data in stored product data and electronic document distribution control data module 855, the NICECAD system provides configuration control by maintaining a history of which teams have accessed which part design models and documents."* (column 14, line 52 – column 15, line 3)].

Regarding claim 65, Thackston teaches that changing the content of the index is allowed only through the gathering from the computerized tools [*"Check-in/check out controls"* (column 14, lines 52-55)].

Regarding claim 66, Thackston teaches incorporating output information of at least one data evaluation program into the database [*"In step 1820, the team member launches the analysis or simulation postprocessing software component consistent with authorization, and in step 1822, the team member performs the postprocessing procedures. In step 1824, the team member posts the results to NICECAD server system 200 and updates appropriate PDM documents."* (column 31, lines 56-61)].

Regarding claim 67, Thackston teaches performing a design-to-cost analysis [*"...the mechanical engineer will need to determine if packaging limits are exceeded and*

the accounting specialists will need to determine if "design to cost" parameters are exceeded." (column 2, lines 22-35)]. It would have been obvious to include a computerized design-to-cost analysis program with the EAS tools shown in FIG. 15 of Thackston because such a tool would automate the design-to-cost analysis performed manually by accounting specialists in the prior art.

Regarding claim 68, Thackston teaches that the at least one data evaluation program comprises a design-for-manufacture-and-assembly program [*"Modules 1524-1532 are especially relevant to fabricators evaluating producibility of a part design model. Machining process simulation module 1524 may be used to evaluate whether a part design model (or portion thereof) may be manufactured using particular machines. For example, the dimensions of the part design model may be considered to determine which machines may be used and what material stock may be used. Casting simulation module 1526 may be used to determine whether casting processes may be used to produce a part design model. Forging simulation module 1528 may be used to determine whether forging processes may be used to produce a part design model. Sheet metal process simulation module 1530 may be used to evaluate whether the part design model may be made of sheet stock. Other manufacturing simulation modules 1532 refers to any other manufacturing simulations that may be offered by the NICECAD system."* (column 26, lines 53-67)].

Regarding claim 69, Thackston teaches storing on a portable computer [*"Prime contractor user systems 220 may comprise ... portable electronic devices"* (column 9, lines 44-52)].

Regarding claim 70, Thackston teaches that the index is open for viewing by all workers working on the project, while changing the index is allowed only to workers responsible for changing the data of the index [*"For example, an EAS team member who checks out the current baseline part design model from module 865 may not be permitted to 'check in' that part design model. This is because it may be that only the prime contractor can authorize writing a baseline part design model to module 865."* (column 15, lines 48-53)].

Regarding claim 71, Thackston teaches viewing in the database, by a worker, information on systems of the vehicle other than the worker is responsible for [*"This would allow, for example, a design team member to interact with a remotely located fabricator team member to view sectional cuts at the same time in order to discuss producibility issues."* (columns 24, line 66 – column 25, line 22)].

Regarding claim 72, Thackston teaches a method of providing information between workers designing a project, comprising:

Providing a working environment including a plurality of different departments, assigned to perform design tasks of respective different vehicle systems [*"In our sonobuoy example, there will be mechanical engineers, electrical engineers, RF*

engineers, acoustic specialists, reliability engineers, safety engineers, signal processing specialists, production engineers and so on." (column 2, lines 9-13)];

Selecting a plurality, but fewer than 10% of the physical elements of each system of the vehicle to serve as major elements of the vehicle element [*"Stored baseline part design model data module 865 may contain the current approved version of the design referred to as the 'baseline.' ... A part design model may be created using the NICECAD CAD capability... In general, stored baseline part design model data module 865 may contain the part design models, such as 3D solid models, including attributes, for the projects in the NICECAD system 100."* (column 15, lines 28-45)]; Omission of an element and its function is obvious is the function of the element is not desired – MPEP 2144.04 (II); Selecting "a plurality, but fewer than 10% of physical elements" merely omits to select additional elements, and does not retain the benefit of selecting additional elements];

Gathering, for each of a plurality of elements of the project, information regarding the element, including an indication of the relative assembly of the element [*"Stored baseline part design model data module 865 may contain the current approved version of the design referred to as the 'baseline.' ... A part design model may be created using the NICECAD CAD capability... In general, stored baseline part design model data module 865 may contain the part design models, such as 3D solid models, including attributes, for the projects in the NICECAD system 100."* (column 15, lines 28-45)];

And a reference to a worker in charge of the element [*"Stored design and analysis access permission data module 860 may comprise data assigned by the prime contractor*

determining which teams (or team members) may access the part design model, documents and EAS processing modules." (column 15, lines 7-11)];

Storing the gathered information in a database having a records only for the major elements [*"Databases 210 may store information for a concurrent engineering development project, such as contracts data, engineering data, account data and other project related data..."* (column 11, lines 17-21); Thackston teaches storing information for the selected elements, as claimed. Selecting only the major elements is explained above.];

Searching the database, by a first worker assigned to one system or discipline of the vehicle, for information on one or more of the elements, and displaying information relating to the one or more elements; and sending an electronic message, by the first worker, to a second worker assigned to another system or discipline of the vehicle, based on information found in the search [*"Multimedia communications processing module 978 provides the multimedia communications capability of the system and, as depicted in FIG. 13..."* (column 24, lines 28-43); *"Quasi-real time graphics processing module 1306 is a module that may permit participants in an on-line communications session to view graphics, such as a 3D part design model or 2D section cuts, rotations, fly-throughs, zooms or pans in a substantially concurrent manner... This would allow, for example, one design team member to engage in the design effort with another remotely located design team member. This would allow, for example, a design team member to interact with a remotely located fabricator team member to view sectional cuts at the same time in order to discuss producibility issues."* (columns 24, line 66 – column 25, line 22)].

Thackston does not explicitly teach a "vehicle" example.

Carver teaches a method of designing a vehicle using CAD [*"A 3-D CAD program or programs, such as CATIA (IBM Corporation) or NCAD and NCAL (Northrop Computer Aided Design and Northrop Computer Aided Lofting, Northrop Corporation, Hawthorne, Calif.) would be suitable to define the master engineering definition of the aircraft 154 in 3-D graphics in the data model."* (column 22, lines 48-54)].

Carver and Thackston are analogous art because both are drawn to CAD.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of Applicants' invention to combine the teachings of Carver with Thackston as expressly motivated by Carver to precisely produce aircraft [*"This invention provides for new and improved methods and apparatus for precisely producing and assembling a multi-copmonent structure such as an aircraft."* (column 6, lines 62-64)] without the disadvantages of prior art methods (columns 1-6). The combination could replace Thackston's "sonobuoy" example with a "vehicle," thus producing "plurality of elements of the vehicle," "different systems or disciplines of the vehicle," and "elements of the vehicle" as claimed.

Regarding claim 73, Thackston teaches gathering at least three levels of a hierarchy of systems and sub-systems to which the major elements belong [*"Component interface analysis processing module 1520 may use numerical techniques to evaluate the interface between parts of a part design model, or between the part design model and external items."* (column 26, lines 47-50)].

Regarding claim 74, it would have been obvious over Thackston in view of Carver to select fewer than 1% of the elements. Omission of an element and its function is obvious is the function of the element is not desired – MPEP 2144.04 (II); Selecting "a plurality, but fewer than 1% of physical elements" merely omits selecting additional elements, and does not retain the benefit of selecting additional elements];

Regarding claim 75, Thackston teaches that the index is open for viewing by all workers working on the project, while changing the index is allowed only to workers responsible for changing the data of the index [*"For example, an EAS team member who checks out the current baseline part design model from module 865 may not be permitted to 'check in' that part design model. This is because it may be that only the prime contractor can authorize writing a baseline part design model to module 865."* (column 15, lines 48-53)].

Regarding claim 76, Thackston teaches gathering information on both electrical and mechanical elements (FIG. 15).

Regarding claim 77, Thackston teaches an apparatus for forming a design index, comprising:

A memory for storing the index (FIG. 2, database 210); and

A computer configured to gather, from a plurality of computerized design tools, each of the tools adapted for designing a different system of a project by performing a plurality of design tasks, information on fewer than all the elements of the vehicle

utilized by the tool in performing said design tasks, such that the gathered information does not include sufficient information for any of said design tasks for which the computerized design tools are adapted, and to store the gathered information in the memory (FIG. 2, "PDM SERVER SYSTEM 202"; FIG. 15). Thackston expressly describes that EAS teams must "check out" the stored "base line" model and modify it to create a "working model" suitable for design tasks (column 15, lines 45-65, et seq.), thus the stored information is insufficient for any design tasks.

Thackston does not explicitly teach a "vehicle" example.

Carver teaches a method of designing a vehicle using CAD [*"A 3-D CAD program or programs, such as CATIA (IBM Corporation) or NCAD and NCAL (Northrop Computer Aided Design and Northrop Computer Aided Lofting, Northrop Corporation, Hawthorne, Calif.) would be suitable to define the master engineering definition of the aircraft 154 in 3-D graphics in the data model."* (column 22, lines 48-54)].

Carver and Thackston are analogous art because both are drawn to CAD.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of Applicants' invention to combine the teachings of Carver with Thackston as expressly motivated by Carver to precisely produce aircraft [*"This invention provides for new and improved methods and apparatus for precisely producing and assembling a multi-copmonent structure such as an aircraft."* (column 6, lines 62-64)] without the disadvantages of prior art methods (columns 1-6). The combination could replace Thackston's "sonobuoy" example with a "vehicle," thus producing "a different system of a vehicle," and "a vehicle design index" as claimed.

Regarding claim 80, Thackston teaches initiating communication between workers designing the project using different computerized tools, using information in the index [*"For example, if a design team and EAS team have a multimedia communications session using the NICECAD system to discuss certain design issues, a record may be stored reflecting the session."* (column 17, lines 34-47)].

Regarding claim 81, Thackston teaches gathering general information authorized for viewing by workers from a plurality of departments on elements having some details restricted to viewing by a limited group of workers [*"... the prime contractor may assign access permissions to part or all of the part design model, project specification, and the EAS processing modules."* (column 14, lines 55-57); *Stored design and analysis access permission data module 860 allows an approval authority to assign access permissions to limit access to those portions of the part design module, those specifications (or portions thereof), and those EAS processing modules as appropriate."* (column 15, lines 7-27)].

Regarding claim 82, Thackston teaches a method comprising:

Providing computerized design tools for various systems of a project (FIG. 15);

Designing various systems of the project by workers using the computerized design tools [*"Teams, such as EAS teams, may need access to all or part of a part design model in order to carry out the analysis for their specific discipline. They may need to access specifications or other documents to perform their tasks. Likewise, those teams may need to access one or more EAS processing modules to carry out the analysis.*

Stored design and analysis access permission data module 860 allows an approval authority to assign access permissions to limit access to those portions of the part design module, those specifications (or portions thereof), and those EAS processing modules as appropriate." (column 15, lines 8-27)].

Generating a database including information on the relationship between elements of the project from the various systems, but including information on fewer than all the elements of the project [*"Stored baseline part design model data module 865 may contain the current approved version of the design referred to as the 'baseline.' ... A part design model may be created using the NICECAD CAD capability... In general, stored baseline part design model data module 865 may contain the part design models, such as 3D solid models, including attributes, for the projects in the NICECAD system 100."* (column 15, lines 28-45)]; Omission of an element and its function is obvious is the function of the element is not desired – MPEP 2144.04 (II); Storing "information on fewer than all the elements" merely omits to store additional information, and does not retain the benefit of storing additional information];

Said database being open to viewing by workers assigned to a plurality of said systems [*"Stored design and analysis access permission data module 860 may comprise data assigned by the prime contractor determining which teams (or team members) may access the part design model, documents and EAS processing modules."* (column 15, lines 8-11)];

Opening the database for viewing a worker assigned to a particular system of the project [*"Multimedia communications processing module 978 provides the multimedia communications capability of the system and, as depicted in FIG. 13..."* (column 24,

lines 28-43); *"Quasi-real time graphics processing module 1306 is a module that may permit participants in an on-line communications session to view graphics, such as a 3D part design model or 2D section cuts, rotations, fly-throughs, zooms or pans in a substantially concurrent manner... This would allow, for example, one design team member to engage in the design effort with another remotely located design team member. This would allow, for example, a design team member to interact with a remotely located fabricator team member to view sectional cuts at the same time in order to discuss producibility issues."* (columns 24, line 66 – column 25, line 22)];

Determining from the database, by one of the workers, which elements of systems other than the system to which the worker is assigned, are directly affected by a possible change in an element of the project in the system to which the worker is assigned ["*This would allow, for example, a design team member to interact with a remotely located fabricator team member to view sectional cuts at the same time in order to discuss producibility issues.*" (columns 24, line 66 – column 25, line 22)];

And performing at least one of displaying information relating to the one or more major elements and sending an electronic message to workers in charge of the elements determined to be affected by the change, to discuss the possible change [*"Multimedia communications processing module 978 provides the multimedia communications capability of the system and, as depicted in FIG. 13..."* (column 24, lines 28-43); *"Quasi-real time graphics processing module 1306 is a module that may permit participants in an on-line communications session to view graphics, such as a 3D part design model or 2D section cuts, rotations, fly-throughs, zooms or pans in a substantially concurrent manner... This would allow, for example, one design team member to engage*

in the design effort with another remotely located design team member. This would allow, for example, a design team member to interact with a remotely located fabricator team member to view sectional cuts at the same time in order to discuss producibility issues." (columns 24, line 66 – column 25, line 22)].

Thackston does not explicitly teach a "vehicle" example.

Carver teaches a method of designing a vehicle using CAD [*"A 3-D CAD program or programs, such as CATIA (IBM Corporation) or NCAD and NCAL (Northrop Computer Aided Design and Northrop Computer Aided Lofting, Northrop Corporation, Hawthorne, Calif.) would be suitable to define the master engineering definition of the aircraft 154 in 3-D graphics in the data model."* (column 22, lines 48-54)].

Carver and Thackston are analogous art because both are drawn to CAD.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of Applicants' invention to combine the teachings of Carver with Thackston as expressly motivated by Carver to precisely produce aircraft [*"This invention provides for new and improved methods and apparatus for precisely producing and assembling a multi-copmonent structure such as an aircraft."* (column 6, lines 62-64)] without the disadvantages of prior art methods (columns 1-6). The combination could replace Thackston's "sonobuoy" example with a "vehicle," thus producing "a different system of a vehicle," and "a vehicle design index" as claimed.

Regarding claim 83, it would have been obvious over Thackston in view of Carver to include less than 10% of the elements. Omission of an element and its function

is obvious is the function of the element is not desired – MPEP 2144.04 (II); including "less than 10% of the elements of the vehicle" merely omits including additional elements, and does not retain the benefit of including additional elements];

Regarding claim 84, it would have been obvious over Thackston in view of Carver to generate a database including information insufficient to allow performing all the design tasks of the vehicle, which can be performed by the computerized tools [This claim apparently encompasses a database storing no information, or omitting some information. Please see MPEP 2144.04(II) as explained above in regard to claim 83.]

Regarding claim 85, Thackston teaches determining the identities of the contacted workers from the database [*"Quasi-real time graphics processing module 1306 is a module that may permit participants in an on-line communications session to view graphics, such as a 3D part design model or 2D section cuts, rotations, fly-throughs, zooms or pans in a substantially concurrent manner... This would allow, for example, one design team member to engage in the design effort with another remotely located design team member. This would allow, for example, a design team member to interact with a remotely located fabricator team member to view sectional cuts at the same time in order to discuss producibility issues."* (columns 24, line 66 – column 25, line 22)].

Regarding claim 86, Thackston teaches a method of providing information between workers designing a project, comprising:

Providing a working environment including a plurality of different departments, assigned to perform design tasks of respective different vehicle systems or disciplines [*"In our sonobuoy example, there will be mechanical engineers, electrical engineers, RF engineers, acoustic specialists, reliability engineers, safety engineers, signal processing specialists, production engineers and so on."* (column 2, lines 9-13)];

Selecting fewer than 10% of the physical elements of each of the systems of the project to serve as major elements of the project [*"Stored baseline part design model data module 865 may contain the current approved version of the design referred to as the 'baseline.' ... A part design model may be created using the NICECAD CAD capability... In general, stored baseline part design model data module 865 may contain the part design models, such as 3D solid models, including attributes, for the projects in the NICECAD system 100."* (column 15, lines 28-45)]; Omission of an element and its function is obvious is the function of the element is not desired – MPEP 2144.04 (II); Selecting "fewer than 10% of physical elements" merely omits to select additional elements, and does not retain the benefit of selecting additional elements];

Gathering, for each of the major elements of the project, information regarding the element, including an indication of the relative assembly of the element [*"Stored baseline part design model data module 865 may contain the current approved version of the design referred to as the 'baseline.' ... A part design model may be created using the NICECAD CAD capability... In general, stored baseline part design model data module 865 may contain the part design models, such as 3D solid models, including attributes, for the projects in the NICECAD system 100."* (column 15, lines 28-45)];

And a reference to a worker in charge of the element [*"Stored design and analysis access permission data module 860 may comprise data assigned by the prime contractor determining which teams (or team members) may access the part design model, documents and EAS processing modules."* (column 15, lines 7-11)];

Storing the gathered information in a database having a records only for the major elements [*"Databases 210 may store information for a concurrent engineering development project, such as contracts data, engineering data, account data and other project related data..."* (column 11, lines 17-21); Thackston teaches storing information for the selected elements, as claimed. Selecting only the major elements is explained above.];

Managing in the database, for each selected element, an action item list including listings of at least one of actions related to the element which need to be performed or which were performed [*"In another embodiment, the working copy version numbers are maintained so that there is a complete history of all working copies of the part design model in the NICECAD system."* (column 16, lines 1-4)];

Opening the database for viewing by workers of a plurality of departments, assigned to different systems or disciplines of the project [*"Teams, such as EAS teams, may need access to all or part of a part design model in order to carry out the analysis for their specific discipline. They may need to access specifications or other documents to perform their task."* (column 15, lines 15-27)];

And contacting a worker in charge of the element based on information found in the search, and discussing with the contacted worker the proposed change [*"Multimedia communications processing module 978 provides the multimedia communications*

capability of the system and, as depicted in FIG. 13..." (column 24, lines 28-43); *"Quasi-real time graphics processing module 1306 is a module that may permit participants in an on-line communications session to view graphics, such as a 3D part design model or 2D section cuts, rotations, fly-throughs, zooms or pans in a substantially concurrent manner... This would allow, for example, one design team member to engage in the design effort with another remotely located design team member. This would allow, for example, a design team member to interact with a remotely located fabricator team member to view sectional cuts at the same time in order to discuss producibility issues."* (columns 24, line 66 – column 25, line 22)].

Thackston does not explicitly teach a "vehicle" example.

Carver teaches a method of designing a vehicle using CAD [*"A 3-D CAD program or programs, such as CATIA (IBM Corporation) or NCAD and NCAL (Northrop Computer Aided Design and Northrop Computer Aided Lofting, Northrop Corporation, Hawthorne, Calif.) would be suitable to define the master engineering definition of the aircraft 154 in 3-D graphics in the data model."* (column 22, lines 48-54)].

Carver and Thackston are analogous art because both are drawn to CAD.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of Applicants' invention to combine the teachings of Carver with Thackston as expressly motivated by Carver to precisely produce aircraft [*"This invention provides for new and improved methods and apparatus for precisely producing and assembling a multi-copmonent structure such as an aircraft."* (column 6, lines 62-64)] without the disadvantages of prior art methods (columns 1-6). The combination could replace

Thackston's "sonobuoy" example with a "vehicle," thus producing "different vehicle systems or disciplines," "systems of the vehicle," "major elements of the vehicle," etc., as claimed.

Regarding claim 87, Thackston teaches a method of designing a project, comprising:

Providing a plurality of design tools (column 20, lines 44-49) each particular tool having a group of authorized users (column 15, lines 7-11) and each containing information regarding parts used in the project under design sufficient to design a portion of the aircraft or ship using the particular design tool (column 15, lines 45-65);

Providing a database containing information regarding fewer than all the parts needed for using any of the design tools and having information regarding parts used for a plurality of said design tools (column 15, lines 45-65) [Only approved or "base line" parts may be stored in the shared database];

Providing access to the database to authorized users of more than one design tool (column 15, lines 7-11); and

Utilizing the one design tool and information not contained in the one design tool but contained in the database to design or modify a part by an authorized user of the one design tool (column 15, lines 45-65).

Thackston does not explicitly teach a "vehicle" example.

Carver teaches a method of designing a vehicle using CAD [*"A 3-D CAD program or programs, such as CATIA (IBM Corporation) or NCAD and NCAL (Northrop Computer Aided Design and Northrop Computer Aided Lofting, Northrop*

Corporation, Hawthorne, Calif.) would be suitable to define the master engineering definition of the aircraft 154 in 3-D graphics in the data model." (column 22, lines 48-54)].

Carver and Thackston are analogous art because both are drawn to CAD.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of Applicants' invention to combine the teachings of Carver with Thackston as expressly motivated by Carver to precisely produce aircraft [*"This invention provides for new and improved methods and apparatus for precisely producing and assembling a multi-copmonent structure such as an aircraft."* (column 6, lines 62-64)] without the disadvantages of prior art methods (columns 1-6). The combination could replace Thackston's "sonobuoy" example with a "vehicle," thus producing the claimed "vehicle design index," "different system of the vehicle," and "elements of the vehicle" as claimed.

Regarding claim 88, Thackston teaches that the information contains data (column 15, lines 45-65). See the rejection of this claim under 35 U.S.C. § 112, second paragraph.

Regarding claim 89, Thackston teaches that workers assigned to said plurality of systems includes workers assigned to all the systems (column 15, lines 7-11).

Regarding claim 90, Thackston teaches that the method is sent automatically (column 17, lines 34-47).

Regarding claim 91, Thackston teaches that each of the parts have an identification code and wherein identical parts in different systems of the aircraft have different codes (column 15, lines 41-45); (column 15, line 66 – column 16, line 4).

Regarding claim 92, Thackston teaches a computer having stored therein a database (FIG. 2) and does not describe that changing worker assignments requires changing part numbers. The remainder of the claim language is directed to an environment in which the invention ("a computer system") could be place. This language does not describe the computer system, and therefore does not describe the invention.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the

advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Proctor whose telephone number is (571) 272-3713. The examiner can normally be reached on 8:30 am-4:30 pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached at (571) 272-3753. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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